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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/713,834	11/15/2000	Hassan S. Hashemi	00CON159P	1030

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EXAMINER
CRUZ, LOURDES C

ART UNIT	PAPER NUMBER
2827	

DATE MAILED: 10/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/713,834

Applicant(s)

HASHEMI, HASSAN S.

Examiner

Lourdes C. Cruz

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-33 and 58-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-33 and 58-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the electrical connection between the thermally conductive vias and the heat spreader must be shown or the feature canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 61 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear to the examiner how the heat spreader is electrically connected to the thermally conductive vias.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18-20, 22-33, and 58-66 are rejected under 35 U.S.C. 102(b) as being anticipated by Selna (US 5640048).

Selna discloses (See cover Fig.) a structure comprising:

A substrate 52, 54 having a top surface for receiving a chip 12; a printed circuit board 18 attached to a bottom surface of said substrate; at least one signal via 6A in said substrate; said at least one signal via providing an electrical connection between a device electrode (on 12, connected to 22/24) of said chip and said printed circuit board;

A plurality of separate thermally conductive vias 6C in said substrate; each of said plurality of separate thermally conductive vias being coupled to a heat spreader 10C, said heat spreader being attached to said bottom surface of said substrate. See that the plurality of thermally conductive vias provides a connection between said chip and said heat spreader (see layer 8C).

Selna also discloses:

- Said chip being a semiconductor chip
- Said substrate comprises organic/ceramic material (Col. 1, lines 15+)
- Said at least one signal via 6A provides an electrical connection between a bond pads 8A and said PCB 18, wherein said bond pad is electrically connected to said device electrode (through wire 22/24)

- Said signal via abuts the bond pad
- Said bond pad electrically connected to said device electrode by a bonding wire 22/24
- Said at least one signal via provides an electrical connection between said device electrode and a land 10A, said land being electrically connected to said PCB (through 14A)
- Said via abuts said land
- Said at least one signal/thermally conductive via comprises Copper (Col. 6, line 35), which is a thermally conductive material
- See that the heat slug/spreader of Selna is attached to the PCB
- A second plurality of signal vias 6B providing connection between a plurality of device electrodes (on 12, connected to 22/24) of said semiconductor chip 12 and said PCB
- Each of said bond pads is electrically connected to a respective one of the device electrodes
- Said second plurality of signal vias provide electrical connections between each one of said plurality of device electrodes and a respective one of said lands 10B, said lands being electrically connected to said PCB (through 14B)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Selna.

See that Selna discloses organic ceramic material for the substrate. However, the claim specifically recites materials such as FR4. These materials are well known and widely used among semiconductor artisans. See that Applicant admits that such materials are well known in the art on page 5 of the present application, and that such materials are not considered to be Applicant's invention due to this admission. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to incorporate materials such as FR4 to the claimed invention since they are readily available, they are well known and widely used in the art as explained above, and because such is admitted by Applicant in the disclosure.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double

patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 18-33 and 58-66 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 09/930747. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Although the claims in the copending application fail to specifically recite:

- A signal via
- Heat spreader
- Copper in the signal vias
- FR4 or polytetrafluoroethylene

See that reciting "signal via" instead of via does not structurally differentiate them from each other since "signal" is considered to be a label. Labels, statements of intended use, or functional language such as we have here in "signal via" does not structurally distinguish the claim over the prior art which shows a structure that may likewise be labeled, used or function as a "signal via" rather than a "via". See *In re Pearson* 181 USPQ 641, *Ex parte Minks* 169 USPQ 120, and *In re Swinwhart* 169 USPQ 226.

Heat spreaders are well known and commonly used in the art for the purpose of driving heat away from the device. Copper is well known in the art for its conductive

properties. Also, see page 5 of the disclosure wherein Applicant admits that FR4 is well known in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the well known heat spreader, copper in the vias, and well known FR4 for the purpose of driving heat away from the device, providing a well known good conductor such as copper in the vias, and for the purpose of providing a common readily available material for the substrate such as FR4, as discussed above.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 18-33 and 58-66 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. US 6191477. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

See that '477 recites:

- a substrate with an upper surface for receiving a chip
- a plurality of vias, lands on the lower surface abutting the vias the vias providing electrical interconnection, a first group of vias connected to the heat spreader

As discussed above, recitation of copper in the vias does not patentably distinguish the claims from those already patented for copper material is well known for its conductive properties and widely used. Also, see that FR4 is admitted to be commonly used in the art by the Applicant (page 5 of the disclosure). Also, see that PCBs have been used in the art for ease of assembly.

Therefore, it would have been obvious at the time the invention was made to incorporate the well known FR4 substrate, the common PCB, and copper in the vias, for the purpose of providing the claimed invention with a substrate made of readily available and common FR4, a PCB that will ease assembly, and copper in the vias that will provide good conductivity.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new grounds of rejection, which was required by applicant's amendment.

Arguments regarding the double patenting rejections are not persuasive because:

See that '477 recites:

- a substrate with an upper surface for receiving a chip,
a plurality of vias
- lands on the lower surface abutting the vias, the vias providing electrical interconnection, and a first group of vias connected to the heat spreader

Reciting "signal via" instead of via does not structurally differentiate them from each other since "signal" is considered to be a label. Labels, statements of intended use, or functional language such as we have here in "signal via" does not structurally distinguish the claim over the prior art which shows a structure that may likewise be labeled, used or function as a "signal via" rather than a "via". See *In re Pearson* 181 USPQ 641, *Ex parte Minks* 169 USPQ 120, and *In re Swinwhart* 169 USPQ 226.

Also, as stated by the examiner PCBs are well known in the art.

Moreover, the examiner is puzzled by applicant's response stating that the present application is not an obvious variation of Hashemi because the "Hashemi patent includes the following elements that are not included...". See that Hashemi's recitation of more specific claims does not prevent it from reciting all the elements in the present Application or from making the present claims an obvious variation of those already patented.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

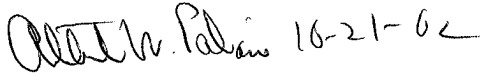
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lourdes C. Cruz whose telephone number is 703-306-5691. The examiner can normally be reached on M-F 10-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Lourdes C. Cruz
Examiner
Art Unit 2827


Lourdes Cruz
October 20, 2002


ALBERT W. PALADINI
PRIMARY EXAMINER